to keep the fish fresh and firm with all the original flavor for a fortnight or longer. The process takes about 3 hours. The fish are first put in a cooling tank filled with water and brought to a low temperature, where they are left for one-half hour. It is next placed in a tank of cold sea water or fresh water strengthened with salt. In order to prevent freezing in the brine the solution is kept agitated by pumping. It is claimed that the low temperature salt solution closes up the surface pores, preventing saturation and also acting as an antiseptic protection on the outside.

It is claimed that the process is cheap in installation and operation and will enable the small producer to get his catch on the market in good condition, thus aiding increased production and safe marketing.

### CYTOLOGICAL CHANGES ACCOMPANYING DESICCATION IN ROTIFERS

Hickernell (Biol. Bul. June, 1917) gives a most interesting account of the desiccation changes in the rotifer *Philodina roseola*, with special reference to cell behavior. Attention is called to the fact that rotifers are resistant not merely to drying. They are resistent to great cold (even — 40° F does not kill them), to great heat, to strong brine, or to rapid changes from one to another of these unfavorable conditions. Murray has summarized this hardiness thus: "Such is the vitality of these little animals [certain south polar Bdelloids] that they can endure being taken from ice at a minus temperature, thawed, dried, and subjected to a temperature not very far short of the boiling point, all within a few hours."

The structural changes in Philodina during desiccation are summarized as follows: The animal as a whole contracts into a form similar to that of extreme contraction in life; no special protecting membrane is formed,—contrary to the common view; the tissues and cells maintain their identity during the drying process; the cytoplasm becomes more dense, and the chromatic part of the nucleus changes from a single large karyosome, separated from a distinct nuclear membrane by a clear space, to chromatic network at the periphery with the clear space internal.

The author believes that some metabolism goes on during the dry condition. The evidence for this lies in the fact that food granules in intestinal cells disappear during desiccation in a manner similar to that seen in starving specimens.

It is suggested that the movement of the chromatin to the periphery of the nucleus during desiccation facilitates cell oxidations during the period. Their change in position takes place at the very beginning of the drying process. On recovery from desiccation the changes are the reverse of those described above.

The acceleration of reproductive activity often noted in rotifers soon after recovering from drying is credited to an increase in ovarian nuclei that occurs during the period of recovery. When death results from desiccation any of the following causes may operate:—mechanical injury due to too rapid drying; starvation due from a lack of reserve food material; poisonous effects of metabolic products; insufficient time during early drying to allow the nucleocytoplasmic reorganization.

### THE FUNDUS OCULI OF BIRDS

In a most attractive atlas Dr. Wood has presented the results of his studies upon representatives of all the leading orders of birds, including more than 100 species. He rightly takes the view that a group of animals with such highly developed and varied vision as birds offers a most fruitful field for the study of all the elements entering into the structure and activity of the eyes.

His method provides for study with the self-luminous ophthalmoscope, macroscopic examination of excised eyes, and microscopic examination of special portions. Owing to the fact that the mydriatics usually used for man have little or no direct effect on the sphincter iris musculature of the bird, it was found necessary to secure dilation by the use of such agents as galvanism, nicotine, curare, and of drugs that render the bird unconscious without actually killing it. It was also found that maximum dilation is to be had a few moments before and after the death of birds, where these are being killed for detailed studies of eye-structure.